

## CONSERVATION FIELD TRIP: MOANALUA VALLEY

### PLANTS

This valley contains over 200 different kinds of native Hawaiian plants and many which have been brought to Hawaii by man from other lands. Some of the Hawaiian plants occur only in Moanalua Valley and not even anywhere else in Hawaii.

Today you are going to see 20 kinds of plants. Some of them are plants from foreign places and some of them are Hawaiian plants. Keep in mind that plants are the most important element of our environment. Without plants, man and animals could not live. Plants convert carbon dioxide into oxygen and are able to manufacture their own food from the chemicals of the earth, water and sunshine. All animals depend on plants for their food. Many of these plants have been very important to the people in the Hawaiian Islands. The following pages tell you something interesting about each plant. Because this is a conservation field trip, we would like to ask a very important favor of you. 3,000 children and their families take this walk into Moanalua Valley every month. May we request that you do not pick anything? If each one of these people picked one leaf, there would be nothing left. This is a good conservation lesson. It is important to conserve Hawaii's plants. You can help today by not destroying these fine plants which are so important to our life.

As you walk up the valley, try to identify each of the plants on this list as you come to them. We had signs in the Valley last summer identifying the plants; a few of the signs and some of the posts that held them are still in place. They may have been replaced by the time you visit the valley. If not, you have a game to play, using the list!

Mahalo

*(Adapted from material prepared for the City and County Summer Fun field trip to Moanalua Valley, summer, 1973)*

## KOA

This is the first koa you will see growing in Moanalua Valley. Your guide will explain why this young tree is being pointed out to you. It has a special significance for this area. Farther up the valley you will see many, many koa trees including some fairly large ones. Koa grows to be the largest of all Hawaiian forest trees. They are found nowhere else in the world but in the Hawaiian Islands. The "leaves" of the koa tree are really not leaves. As you go along the trail, look for a young koa tree and you will find that on very young plants there are true leaves which are finely divided and almost fernlike. As the tree becomes larger these disappear and in their place grow these flat somewhat curved things that look like leaves. They are actually flattened stems that can do all the work of a real leaf. They permit the tree to withstand the heavy winds which blow through Hawaii's mountains and valleys. The wood of the koa tree was extremely important to the ancient Hawaiians as it still is in modern days for all of us. It is a very hard wood that we now use to make furniture, wood paneling for rooms, ukuleles and all sorts of small ornamental objects. In the old days Hawaiians used its tough wood to carve their great war canoes and to make surfboards. It was the most valuable timber the Hawaiians had. When a Hawaiian chief wanted to make one of the famous war canoes, he and a kahuna would select a particularly fine straight koa tree up in the mountains and after proper religious observances would cut the tree down, do the carving and a great number of men would drag the huge hull down to the ocean. These koa canoes were used for long sea voyages and were very durable. At one time koas and kukuis probably covered much of the valley floor. But many years ago the valley was used for cattle grazing and the trees gradually died out. Now the cattle have been removed from the valley and both kukui trees, which you will see later, and koa trees are quickly coming back again to reforest the valley floor.

## KOA-HAOLE

This tree, introduced from the tropics of South America many many years ago, is called koa-haole meaning the foreign koa because its leaves look like the leaves on a very young koa tree. The seed pods which you can also see on this koa-haole tree look very much like the seed pods of the real koa tree. Koa-haole was introduced into Hawaii as a cattle food inasmuch as both the leaves and seed pods make a very nourishing food for cattle. People who have horses do not permit the horses to eat koa-haole, however, because the plant contains a chemical which causes the horse's tail to fall out. Stores in Hawaii sell beautiful leis made of the small brown seeds of the koa-haole. Although most gardeners consider koa-haole to be a bad pest, it has been a very fine plant for Hawaii. The leaves and the pods quickly build up a thick mulch on the ground, covering it and preventing soil from washing and blowing away. This tree has been a very fine conservation plant for our islands.

## BAMBOO

This giant bamboo was originally brought to Hawaii many many years ago from tropical Asia. It is one of the construction bamboos; the long stems are exceedingly strong. Several other kinds of bamboo were introduced a number of years ago to help reforest Hawaii's mountains. You will see two or three more haole varieties as you go up the valley. The Hawaiians had their own variety of bamboo called "OHE" which they cultivated for the many uses to which the long hollow stems could be put. In addition to general building purposes bamboo is used to make many different musical instruments, containers and weapons. Bamboo is a kind of grass. It is the largest member of the grass family. Other grasses that you are familiar with include sugar cane, the growing of which is one of Hawaii's major industries.

## MONKEY POD

These beautiful trees were brought to Hawaii from the tropics of the northern part of South America. They were introduced because they furnish very fine and useful wood. Many of you in your houses will have tables, chairs, beautiful platters, bowls and trays made out of this tough wood. Another use for the monkey pod tree comes from its large sticky seed pods which make a good cattle food. But most important they are beautiful to see in our environment and provide cool shade for us to relax in.

## ROSE APPLE

The rose apple tree originally came to Hawaii from India and Malaya. The large yellow fruits are good to eat and have a faint smell like a rose. That is why it is called a rose apple. In India some people think that this is a very important religious tree called "Jambu" which has seeds that produce gold and juice that forms a river whose waters have healing powers. The Buddha is sometimes pictured under a rose apple tree. In Hawaii the rose apple tree has been used for reforestation in moist valleys such as Moanalua where it grows rapidly and helps to prevent soil erosion. This is another good conservation tree. Look across the road from the rose apple tree and you will see a number of plants called ki or ti. I am sure that these are familiar to all of you. You grow them around your homes. We will learn more about the ki (or ti) plant farther up the valley where it is related to an important archeological place.

## LAUA'E

This beautiful wild fern is found not only in Hawaii but throughout Polynesia and the tropics of Asia. It was popular in Hawaii for making leis and for decorating for luaus. The laua'e fern can be seen as an ornamental plant in many of Hawaii's gardens. There is one variety which has the fragrance of vanilla in the leaves. The word laua'e in Hawaiian means fragrant leaf.

## LANTANA

The lantana shrub came to Hawaii from South America. It was originally brought to Hawaii as an ornamental because all year round it is covered with its attractive flowers. However, in Hawaii's climate it grows very rapidly. You will notice on the stems are sharp thorns or kukus and if you will smell the plant it has strong odor. Cattle will not eat it. Lantana quickly became a very bad pest in the cattle raising areas because it spread rapidly and shaded out the good grasses which the cattle and cows like to eat. In order to help to get rid of lantana or at least control it, the government has introduced several kinds of insects which destroy lantana. Look closely at the plants. Some of them will have leaves with chewing marks on them. This was made by one kind of insect which eats lantana leaves. On some of the plants where the leaves come out you will notice swellings. This is caused by another kind of insect. This helps to kill the lantana by interrupting the flow of foods and liquid up and down the stem. Another kind of insect lays its eggs in the flower and the newly hatched young prevent the seeds from being formed and from starting new plants. This is an interesting kind of conservation called biological control. Sometimes control has to be placed on plants or on animals so that they do not destroy other plants or animals which may be more helpful. Biological control utilizes insects as in this case rather than poison sprays which may have harmful effects on the soil or on other plants. The insects that attack lantana do not bother any of the other plants nearby. Conservationists are busy all over the world looking for biological controls such as the ones for lantana rather than poisoning our earth with bad chemicals.

Behind you, across the road from the lantana bushes, notice the very strong, healthy, young koa trees. You will see larger and larger koa trees as you progress up the valley.

#### JAVA PLUM

Another tree brought to Hawaii, this one well over a hundred years ago, is from tropical Asia. The Java plum is found from Java in Indonesia around the Indian Ocean to India. It is very commonly seen in pasture lands and waste places in Hawaii. Many of you are familiar with this tree because it drops dark purple fruits which are edible. The Java plum tree is very tough and will grow in places where many other trees have difficulty surviving. It is a good erosion tree and is a good conservation plant.

#### BAY RUM

A very interesting tree from the West Indies was introduced into Hawaii a number of years ago because of the fragrance of the leaves. The bay rum tree is used for making hair oil. In the barber shop look on the shelf behind the chair and usually you will find a bottle marked "bay rum". After the barber gives you a haircut sometimes they will comb your hair with this fragrant oil. Some kinds of perfumes for ladies are also made from the fragrance of the leaves of this tree. The bay rum tree has gone wild in the Moanalua Valley and if you will look around you as you walk up the valley, you will see here and there on the hillsides its dark shiny leaves. If you walk by the tree when the wind is blowing strongly, you can smell the very good perfume from the leaves.

#### CHINESE FAN PALM

From the forests of tropical Asia over a hundred years ago was brought to Hawaii seed of this very tough fan palm tree. As you can see they have gone wild here in the valley. There are many of them along the roadside. The large leaves of this palm are useful for thatching and for weaving into baskets and other containers. The strong wood of the trunk can be used for construction. The Chinese fan palm looks similar to a native Hawaiian palm which also grows in Moanalua Valley, but it grows way up at the head of the valley in places which you will not be walking into today. This palm, which Hawaiians call "LOULU", is found only up in the mountains at the head of this valley and nowhere else in the whole world. This kind of plant is called an "endemic" plant. These endemic plants are extremely rare and are some of the kinds of things that conservationists are trying to preserve.

#### HALA

This hala tree is not the Hawaiian hala but is one of more than 400 different kinds of hala which occur throughout the tropics of the world. The Hawaiian hala tree which is found growing naturally only on the windward side of the Pali was brought into Moanalua Valley from the other side of the island during the days of earliest settlement here in the valley. There is one place in the valley which the Hawaiians called "Mokuhala" which means the hala grove. This was the place where the hala trees were cultivated. The reason the Hawaiians cultivated the hala was for its important uses. The leaves, "lauhala," were used for weaving mats and containers as well as for thatching houses. We have found only one Hawaiian hala tree left in the valley.



### 'AWAPUHI

This small plant is a kind of wild ginger. It has an underground stem much like the ginger we buy in stores to flavor our food. In the old days Hawaiians used to grind up this root and use it to scent their tapa cloth. The flower stalk and head which look like a dwarf torch ginger sometimes is called shampoo ginger because there is a liquid inside of the flower which when mixed with water makes soap suds that you can wash your hair with. You will see 'awapuhi growing all along the road, here and there for the whole length of your conservation hike. Just above the 'awapuhi on the right side of the road are two other kinds of ginger. Both of these originally come from India. Both are familiar to our island people. These are white ginger and yellow ginger. As you know these are commonly made into very beautiful and fragrant leis and maybe you have been on school tours to the perfume factory where you have seen and smelled perfume scented with these flowers. In some countries experiments are going on for using the old stalks of ginger for making paper.

### PALA'A

Pala'a is one of the commonest and most beautiful wild ferns in Hawaii. It is also found in other parts of Polynesia and southeastern Asia. Hawaiians use this fern to extract a dark brown dye for their tapa cloth. There is a famous Hawaiian legend about Hiiaka, the sister of Pele the volcano goddess. During a great battle against the Mo'o (the dragon) which she fought to protect her sister, she used this fern to entangle and trip the Mo'o whereupon she killed him. Pala'a was also used by the Hawaiians as a medicine. Sometimes this beautiful fern may be seen woven into leis or as a backing for flower leis.

### ULUHE

One of the most widespread plants at higher wet elevations is the Uluhe or staghorn fern. It is found in many other tropical countries as well as Hawaii. If you look up on high mountains and see large patches of light green colored plants, usually these are great thickets of Uluhe fern. Uluhe ferns are very primitive plants. They trace their ancestry back to the coal age many millions of years ago and are virtually unchanged from that time.

### KI

The plant commonly grown in our Hawaiian gardens and known as ti, which is a Tahitian word for this plant, was known to the Hawaiian as ki. You saw plants of ki growing here and there all along your walk this far. This place in which you are now standing and about which you just heard from your guide was a very important place for ki plants. In fact, the old name for this area was Kahalelauki which means "the house of the ti leaves." If you look closely throughout the hau thickets and the shrubbery all around you, you will see that there are great many ki plants still here. The Halelauki was a very special place in the heiau or temple which was thatched with leaves of this plant. The ti leaf was always a royal symbol or a god symbol. It was particularly representative of the god Lono. If you have been to the Bishop Museum you have seen the large emblems called kahilis which in the later days of the Hawaiian kingdom were made from feathers. In the earliest days some historians believe that the kahili was simply a stalk of the ki plant and this was carried by the priest or kahuna as an emblem of religious power and, of course, you know about many other practical uses of the leaves of this plant. If you have eaten laulaus

you know that the food inside is wrapped in ti leaves before being placed in the steamer to cook. Also the Hawaiians made many kinds of things from the ti leaves. In addition to thatch, they used the leaves to make raincoats, as wrappers for food and for carrying containers.

### KALO

In the olden days the Hawaiians developed many different kinds of kalo or, as we more commonly hear, taro. Kalo is an edible plant and was one of the most important foods in the Hawaiian diet. The young leaves are cut and cooked as greens and the fleshy root is pounded and prepared to make poi. I am sure all of you have eaten poi and luau which is the name for the leaves. In this small area a group of volunteers from the University of Hawaii recently planted several different kinds of Hawaiian plants so that when they grow, people can see them in a more natural setting. These kalo plants and the two young bananas behind them were some of the plants planted by these volunteers. When the plants have grown we will have an exhibit here of the kind of food plants that the ancient Hawaiians grew. At one time when Hawaiians still lived in this valley, there were small planting terraces all along Moanalua stream and to this day in certain areas, it is still possible to see the low stonewalls which contained soil in level terraces where taro, sweet potatoes, bananas and other food plants were raised.

### KUKUI

In your school studies I know that you have had a unit on the history of Hawaii and the Hawaiian people. You will remember that most historians feel that Polynesians migrating from Tahiti and certain nearby islands arrived in Hawaii over a thousand years ago. With them they brought a number of very special plants that were important to them and which they knew they could live on if they did not find new useful plants in the area to which they were migrating. One of these plants which they brought with them was the kukui tree, the tree that you are looking at now. The kukui tree was very useful to the Hawaiians. The seeds furnished oil which was used among other things to make lamps. In fact the word kukui in Hawaiian means light. The haole name for this tree is the "candlenut tree" because when the nuts become fully ripe, it is possible to string them on a stick and light them like a candle. The wood of the kukui is also useful. There is a medicine that can be made from the fruit and from the bark, tapa dye was derived. Just behind you, you will remember seeing the newly planted taro and banana plants. These are other plants that the migrating Polynesians brought with them. Originally these plants came from the wilds of southeastern Asia thousands of years ago and as the Polynesians migrated across the Pacific Ocean, they carried these plants with them. Other plants that you were familiar with that were brought at the same time include the ki or ti plant which we talked about and the coconut palm which everyone in Hawaii is familiar with, mountain apple tree, a kamani tree, milo tree and several others. The kukui tree is Hawaii's state tree.

### HAU

The hau tree is one of the commonest trees in Hawaii and is found in all areas of the tropics. It is a very useful tree because the bark of the tree contains long fibers which can be twisted into ropes to make nets and cordage. The wood of the hau tree is very light and can be used for floats and sometimes the curved portion of the outrigger on the canoe. In the old days Hawaiians would collect hau leaves and spread them carefully on the taro patch after the water had been drained off and stamp them into the mud to enrich the soil. This we call composting. You can see that ancient men knew many of the secrets of good agriculture and conservation. The hau is a

member of the hibiscus family. Try to find one of the flowers. In the morning they look like a large yellow hibiscus but during the day gradually turn dark until at the end of the day they are mahogany red color. In other parts of the Pacific particularly in Micronesia, the fine fibers from the bark are woven into very beautiful and useful cloth. Proceed along the road, follow the arrow toward Station Guava.

#### 'OHI'A-LEHUA

You have probably noticed by this time that once you passed the great petroglyph rock, you entered into a plant area quite different from the lower part of the valley. For some strange reason the rock at Kahaukomo marks the place where one begins to see more and more native Hawaiian plants. One of the most beautiful which you have noticed by now is the 'ohi'a-lehua with its bright red fuzzy flowers. If you look around you will find a number of young trees, some of them in flower. The 'ohi'a-lehua is one of the largest of Hawaiian native trees growing as tall as 100 feet. These are commonly seen on the Big Island of Hawaii. The flower is mentioned in many Hawaiian songs and stories and from it a particularly beautiful lei is made. It is the flower of the Island of Hawaii. There is a story that if a lehua blossom is picked on the way toward the mountains, it will rain. The wood from the 'ohi'a-lehua is extremely hard and a beautiful dark red in color. In the olden days Hawaiians used it for religious statues and for making spears, mallets and other weapons. Today 'ohi'a trees are cut to make wood for the making of flooring, interior furnishing and panelling.

#### MOUNTAIN NAUPAKA

This bush is endemic to the Hawaiian Islands, that is to say, it is not found anywhere else in the world. If you look closely, you will see the small white flowers appear to be only half of a flower. Those of you who have lived near the coast in Hawaii will remember another plant called naupaka or beach naupaka which has a flower just like this one. It also looks like only a half of a flower. There is an old Hawaiian legend about a boy and a girl who were very much in love and who wanted to get married but their parents disapproved so the girl was sent off to the mountains and the boy was sent to the sea coast so that they could not see each other again. And the story is that the half flowers of the naupaka plant represent the two young lovers and that when the two lovers meet again that the flowers will again be whole.

Proceed to the top of the road where you will be able to enjoy the view of the mountains at the end of the valley. It is in these beautiful green mountains and their ravines where so many of the endemic Hawaiian plants are to be found--the rare loulu palms, the beautiful sandalwood trees, awa, hibiscus trees 25 feet tall with great white flowers that are fragrant and several other varieties of 'ohi'a-lehua including one with bright yellow flowers. In the ravine you can see the bright patches of silvery green which are groves of giant kukui trees. If you look closely, you can see large koa trees with their gray green foliage and in the valleys and ravines are native Hawaiian birds.

What you have seen today and what you are still looking at is part of Hawaii's rich heritage--her land, her people, her history. These are all things very much worth saving and this is what conservation is all about.